

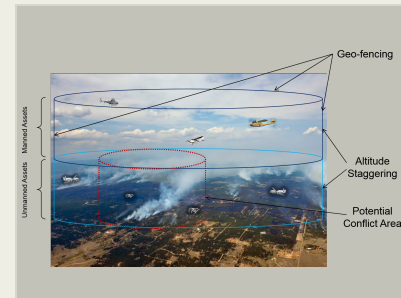
ON-DEMAND: Operations in Dynamic Environments with Manned And Unmanned Aircraft Deconfliction, Phase I

Completed Technology Project (2017 - 2017)



Project Introduction

NASA Unmanned Traffic Management Program (UTM) and its early builds focus on requirements for fixed geofencing and low-altitude UAS without interaction with manned flights. However, later builds will require functionality for operation in dynamic missions employing multiple collaborating UAS in mixed manned-unmanned teams, and in environments where pre-specified geofencing, flight planning, and separation rules are not applicable. To address this challenge, SSCI proposes to develop, implement and test an innovative ON-DEMAND (Operations in Dynamic Environments with Manned And Unmanned Aircraft Deconfliction) system, a portable ATC center, whose role will be to monitor the environment, predict the environmental changes, and approve new geofencing boundaries, new manned-unmanned vehicle separation boundaries, and new flight plans in real-time while avoiding conflicts and assuring overall system safety. Specific system functions will include: (i) Prediction and adjustment of the geofence boundaries based on user requests or environmental changes; (ii) Prediction of the effects of user commands which may generate potential conflicts between manned and unmanned aircraft; and (iii) Dynamic mission re-planning, requiring real-time generation of new flight-plans under separation assurance guidelines. The main project objective is to develop requirements for the design and implementation of a local ATC for dynamically varying environments. We plan to propose an effective mission and flight plan re-planning approach, and effective conflict monitoring and resolution procedures which will enable smooth mission operation while assuring overall system safety. Under the project SSCI will leverage its state-of-the-art flight path prediction routines, collision detection and avoidance system, and system-level safety evaluation approach. Phase I will also include simulation testing and flight data collection with our partners at Olin College of Engineering.



ON-DEMAND: Operations in Dynamic Environments with Manned And Unmanned Aircraft Deconfliction, Phase I Briefing Chart Image

Table of Contents

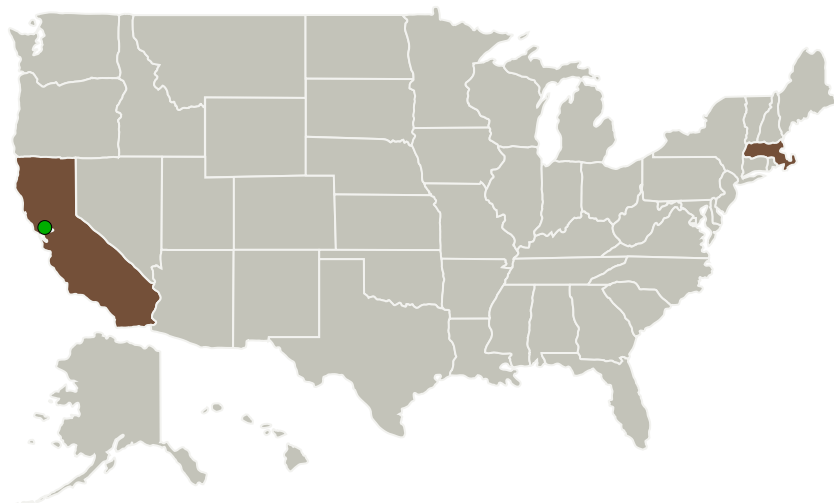
Project Introduction	1
Primary U.S. Work Locations and Key Partners	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Images	3
Technology Areas	3
Target Destinations	3

ON-DEMAND: Operations in Dynamic Environments with Manned And Unmanned Aircraft Deconfliction, Phase I

Completed Technology Project (2017 - 2017)



Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Scientific Systems Company, Inc.	Lead Organization	Industry Small Disadvantaged Business (SDB)	Woburn, Massachusetts
● Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations

California	Massachusetts
------------	---------------

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Scientific Systems Company, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

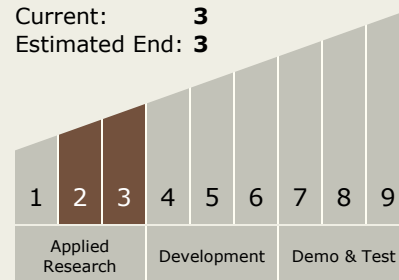
Carlos Torrez

Principal Investigator:

Joseph Jackson

Technology Maturity (TRL)

Start: 2
Current: 3
Estimated End: 3

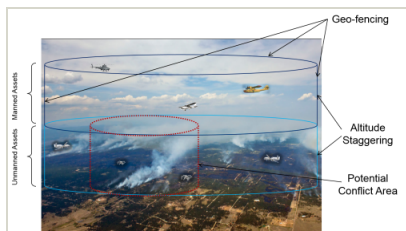


ON-DEMAND: Operations in Dynamic Environments with Manned And Unmanned Aircraft Deconfliction, Phase I

Completed Technology Project (2017 - 2017)



Images



Briefing Chart Image

ON-DEMAND: Operations in Dynamic Environments with Manned And Unmanned Aircraft Deconfliction, Phase I Briefing Chart Image

(<https://techport.nasa.gov/image/128007>)

Technology Areas

Primary:

- TX16 Air Traffic Management and Range Tracking Systems
 - └ TX16.1 Safe All Vehicle Access

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System